MORRISON MAIERLE, INC.
An Employee-Owned Company

ENGINEERS
SURVEYORS
PLANNERS
SCIENTISTS

1 ENGINEERING PLACE • P.O. BOX 6147 • HELENA, MT • 59604 • 406-442-3050 • FAX: 406-442-7862

August 9, 2007

Ms. Michele Lemieux
DNRC
P.O. Box 201601
Helena, MT 59620-1601

Re: Swift Dam and Dike EAP Updates
MT-581 and MT-580

Dear Sir/Madam:

Enclosed are updated pages for the Swift Dam Emergency Action Plan (EAP). The changes include current names and telephone numbers for the emergency evacuation list and emergency support staff. Therefore, it is very important that the EAP be updated as soon as possible. This update requires your assistance with the following:

1. Locate the Swift Dam EAP binder.
2. Replace the updated EAP pages.
3. Discard the outdated EAP pages.

Please feel free to contact me if you have any questions or comments on these materials.

Thank you for your assistance.

Sincerely,

MORRISON-MAIERLE, INC.

Kenneth W. Salo, P.E.
Senior Water Resources Engineer

Attachments

cc: Vern Stokes, PCCRC (Copies No. 1,2, and 3)
Lawrence Siroky, DNRC, (Copy No. 4)
Ken Salo, MMI (Copy No. 5)
Pondera County Sheriff (Copy No. 6)
Pondera County DES (Copy No. 7)
Blackfeet Law Enforcement (Copy No. 8)

Chad,
Sorry I'm late.
Vern.

January 23, 2009

Ms. Michele Lemieux
DNRC
P.O. Box 201601
Helena, MT 59620-16

Re: Swift Dam and Dike EAP Updates
MT-581 and MT-580

Dear Michele:

Enclosed are updated pages for the Swift Dam Emergency Action Plan (EAP). The changes include current names and telephone numbers for the emergency evacuation list and emergency support staff. Therefore, it is very important that the EAP be updated as soon as possible. This update requires your assistance with the following:

1. Locate the Swift Dam EAP binder.
2. Replace the updated EAP pages (cover page to the page just before the Appendix).
3. Discard the outdated EAP pages.

Please feel free to contact me if you have any questions or comments on these materials.

Thank you for your assistance.

Sincerely,

Pondera County Canal and Reservoir Company

Vern Stokes, Manager

Attachments

cc: Vern Stokes, PCCRC (Copies No. 1,2, and 3)
Michele Lemieux, DNRC, (Copy No. 4)
Ken Salo, MMI (Copy No. 5)
Pondera County Sheriff (Copy No. 6)
Pondera County DES (Copy No. 7)
Blackfeet Law Enforcement (Copy No. 8)

EMERGENCY ACTION PLAN
SWIFT DAM AND DIKE
MT-581, MT-580

OWNER:

PONDERA COUNTY CANAL AND RESERVOIR COMPANY
P.O. BOX 245
VALIER, MONTANA 59486
PHONE: (406) 279 - 3315

ORIGINAL DATE: JUNE 1990

REVISIONS:
11/15/95
1/15/97
5/98
3/01
2/03
8/07
1/09

COPY NO. 4

PREPARED BY:

MORRISON-MAIERLE, INC.
910 HELENA AVENUE
P.O. BOX 6147
HELENA, MT 59604
PHONE: (406) 442 - 3050

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

TABLE 1
IMMEDIATE NOTIFICATION LIST

If Swift Dam is failing or failure seems imminent, call:

Pondera County Sheriff..... 911

Blackfeet Law Enforcement 338-4000

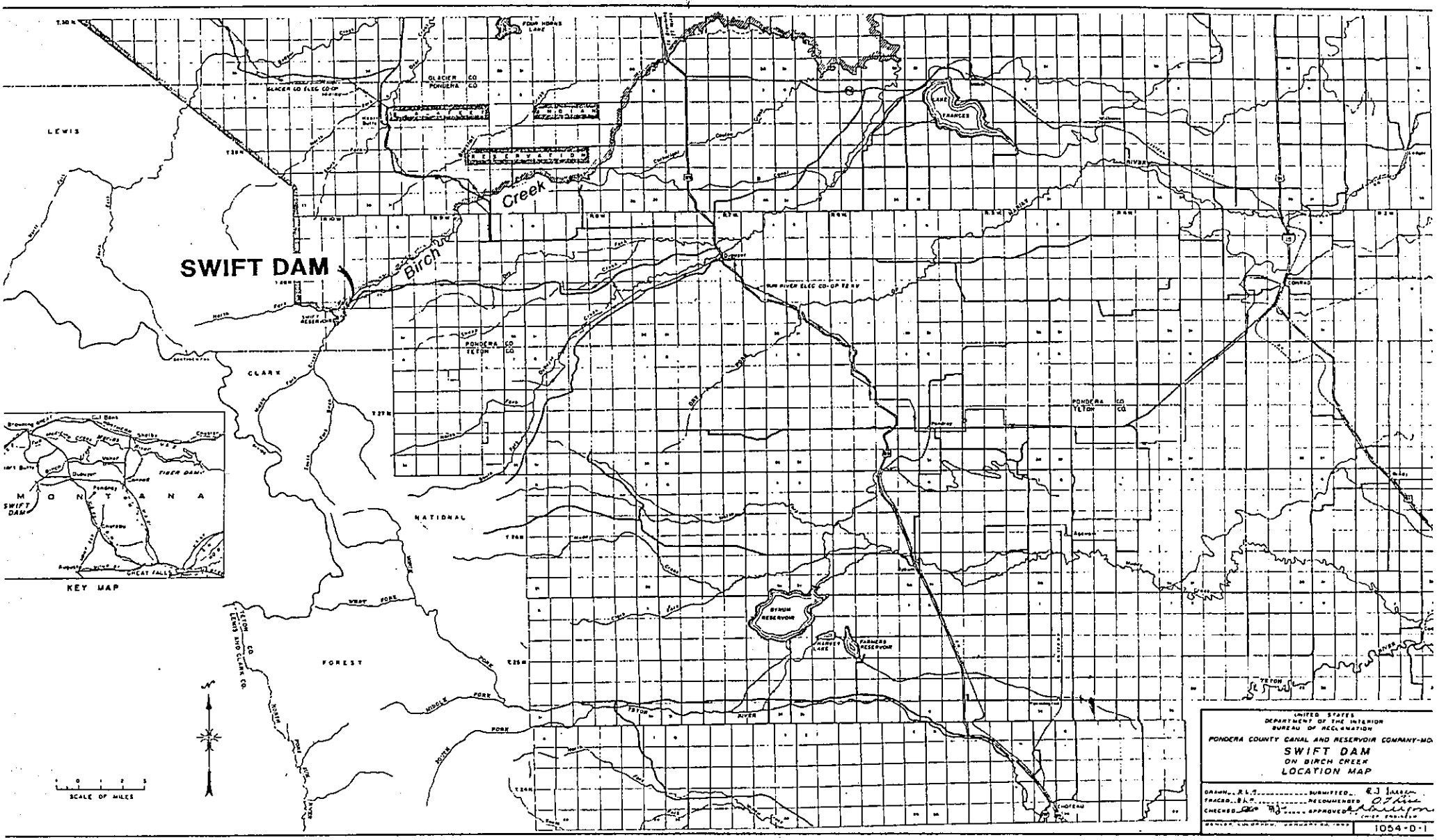
Disaster and Emergency Services 271-4040
Home 278-5378

Vern Stokes, Project Manager..... 279-3315
Home 279-3378
Cell 289-0529
Cell 289-0606

OR

Stan Wangseng, Assistant Manager..... 279-3315
Home 279-3788
Cell 289-0531

Mary Bartkoske, Dam Operator 472-3298
Ranch 472-3331
Cell 949-3101



LOCATION MAP

1 INTRODUCTION

1.1 PURPOSE

The purpose of this emergency action plan (EAP) is primarily to safeguard the lives and secondarily to reduce property damage of the citizens of Pondera County, living along Birch Creek in the event of flooding caused by a failure of Swift Dam.

1.2 DESCRIPTION OF DAM

Swift Dam is located in Pondera County, Section 27, Township 28 North, Range 10 west on Birch Creek, tributary to Marias River. It is owned by Pondera County Canal and Reservoir Company, P.O. Box 245, Valier, Montana 59486, and is used for irrigation, and recreation purposes. Technical data pertaining to Swift Dam is listed in Appendix C and its structures are shown in Appendix D.

1.3 ACCESS TO DAM

Swift Dam is assessed by traveling north on U.S. 89 to 3/4 of a mile north of Dupuyer, Montana, turn left on gravel road and proceed on main road about 19 miles to Swift Dam. As shown on the inundation map in Appendix B, one road accesses the Swift Dam from Highway 89. **Note that this road is within the dam break floodplain and the valley below the dam will be flooded.** The nearest telephone is at the home of Mary Bartkoske (472-3298 or 472-3331), dam operator who lives 1/4 mile from the dam. The gate house cannot be accessed during a major flood event.

Alternate access routes could include cross-country travel from Dupuyer to the dam site by snowmobile, all-terrain vehicle or four-wheel drive vehicle. This form of alternate access would likely require at least 2 hours. Air access would be limited to helicopter with the nearest equipment most likely located in Great Falls.

1.4 HAZARD AREA

The original Swift Dam broke during the flood of June 1964. The failure of the existing concrete arch dam would produce a failure similar to that of the 1964 dambreak and can be used as a point of reference by those who remember that event.

The evacuation area would extend downstream along the following stream reaches; 1) Birch Creek to the confluence with the Two Medicine River, 2) Two Medicine River from the confluence with Birch Creek to the confluence with the Marias River, and 3) Marias River from the confluence with the Two Medicine River to Tiber Reservoir.

The first two reaches are delineated on the mapping included in Appendix B. The characteristics of the dambreak flooding are shown on Table 1.

The dambreak flood at the Marias River would be approximately equal to; 1) the 1964 flood

elevation which included the dambreak of the original Swift Dam, or 2) approximately five (5) feet greater in stage than the 1975 flood. All people in the 100-year floodplain on the Marias River should be evacuated. There would be approximately 5 hours of warning time for inhabitants in the Marias River floodplain.

TABLE 2
DAMBREAK FLOOD CHARACTERISTICS

RVR MILE FROM DAM	MAX FLOW (CFS)	MAX DEPTH (FT)	TIME(HR) MAX DEPTH	TIME(HR) FLOOD	LOCATION
.00	2017211.	66.52	.05	.00	
.87	1829692.	34.26	.10	.05	
1.82	1811395.	36.25	.14	.10	
3.00	1737011.	80.51	.20	.15	
5.05	1590660.	52.05	.34	.29	
8.40	1331926.	52.84	.49	.44	
9.35	1318607.	42.48	.58	.53	Heart Butte Rd.
14.08	1146454.	38.44	.95	.90	
17.77	989813.	40.43	1.32	1.27	
21.20	901202.	28.06	1.80	1.76	Highway 89
26.87	847635.	23.36	2.28	2.24	
35.38	839159.	86.58	2.45	2.40	Kuka Crossing
44.38	663464.	81.40	3.43	3.38	
48.90	495681.	47.96	4.29	4.24	
57.13	491623.	58.35	4.46	4.41	
58.92	486707.	63.29	4.99	4.94	Two Medicine R.
62.35	453810.	39.01	5.48	5.43	Marias River

1.5 RESPONSIBILITY AND AUTHORITY

Pursuant to the State of Montana Dam Safety Act, Chapter 15 of Title 85, the dam owner is responsible for production, coordination, maintenance, and implementation of this emergency action plan. Extent of owner implementation was defined through coordination of this plan with the Pondera County sheriff and disaster and emergency services personnel.

1.6 PERIODIC REVIEW AND UPDATING

This document requires periodic review and updating. Each copy should be kept current and the distribution list is shown on Table 2. The owner will review and update this EAP on at least a yearly basis and distribute the revisions to each copy shown on the distribution list. Review and update by a professional engineer will be accomplished as required by the dam's operation permit, but no less than every five years.

TABLE 3
EAP Official Distribution List

Location	Copy #
Swift Dam	1
Dam Caretaker's house	2
PCC&RC offices in Valier	3
DNRC Dam Safety Section	4
Morrison-Maierle, Inc.	5
Pondera County Sheriff	6
Disaster and Emergency Services	7
Blackfeet Law Enforcement	8

2 NOTIFICATION PROCEDURES

2.1 FAILURE IS IMMINENT OR HAS OCCURRED

If Swift Dam is failing, two things must be undertaken immediately: (1) the hazard area downstream from the dam must be evacuated, and (2) any steps that might save the dam or reduce damage to the dam or hazard area should be taken. (Refer to the map in Appendix B to determine the areas that are likely to be inundated if the dam fails). The evacuation will be handled according to the county warning plan.

2.1.1 WHAT THE DAM OWNER SHOULD DO

As dam owner, it is your responsibility to:

A. Call the Sheriff's Dispatch Center 911 and Disaster and Emergency Services 271-4040 or 278-5378. Be sure to say, "This is an emergency". They will call other authorities and the media and begin the evacuation.

B. Do whatever is necessary to bring anyone in immediate danger (someone on the dam, or directly below the dam, or boating on the reservoir, or evacuees if directed by the sheriff) to safety.

C. Keep in frequent touch with Disaster and Emergency Services. They will tell you how to handle the emergency.

D. If all means of communication are lost: (1) try to find out why, (2) try to get to another radio or telephone that works, or (3) get someone else to try to reestablish communications. If these means fail, handle the immediate problems as well as you can, and periodically try to reestablish contact with Disaster and Emergency Services.

E. It is important that you accurately judge whether the dam is about to fail. If you aren't sure whether the dam is threatened, seek advice from a qualified engineer or call the Department of Natural Resources and Conservation Dam Safety Section (444-6816) or 431-7475.

2.2 POTENTIALLY HAZARDOUS SITUATION IS DEVELOPING

A potentially hazardous situation is an event or condition not normally encountered in the routine operation of the dam and reservoir. Among the unusual occurrences that may affect the dam are dam embankment problems, failure of the spillway or outlet works, heavy precipitation or rapid spring snowmelt, landslides, earthquakes, erosion, theft, vandalism, acts of sabotage, and serious accidents. These occurrences may endanger the dam, the public, or the downstream valley and may necessitate a temporary or permanent revision of the dam's operating procedures.

FIGURE 1
SWIFT DAM
ACTUAL OR IMMINENT FAILURE
"NOTIFICATION FLOW CHART"

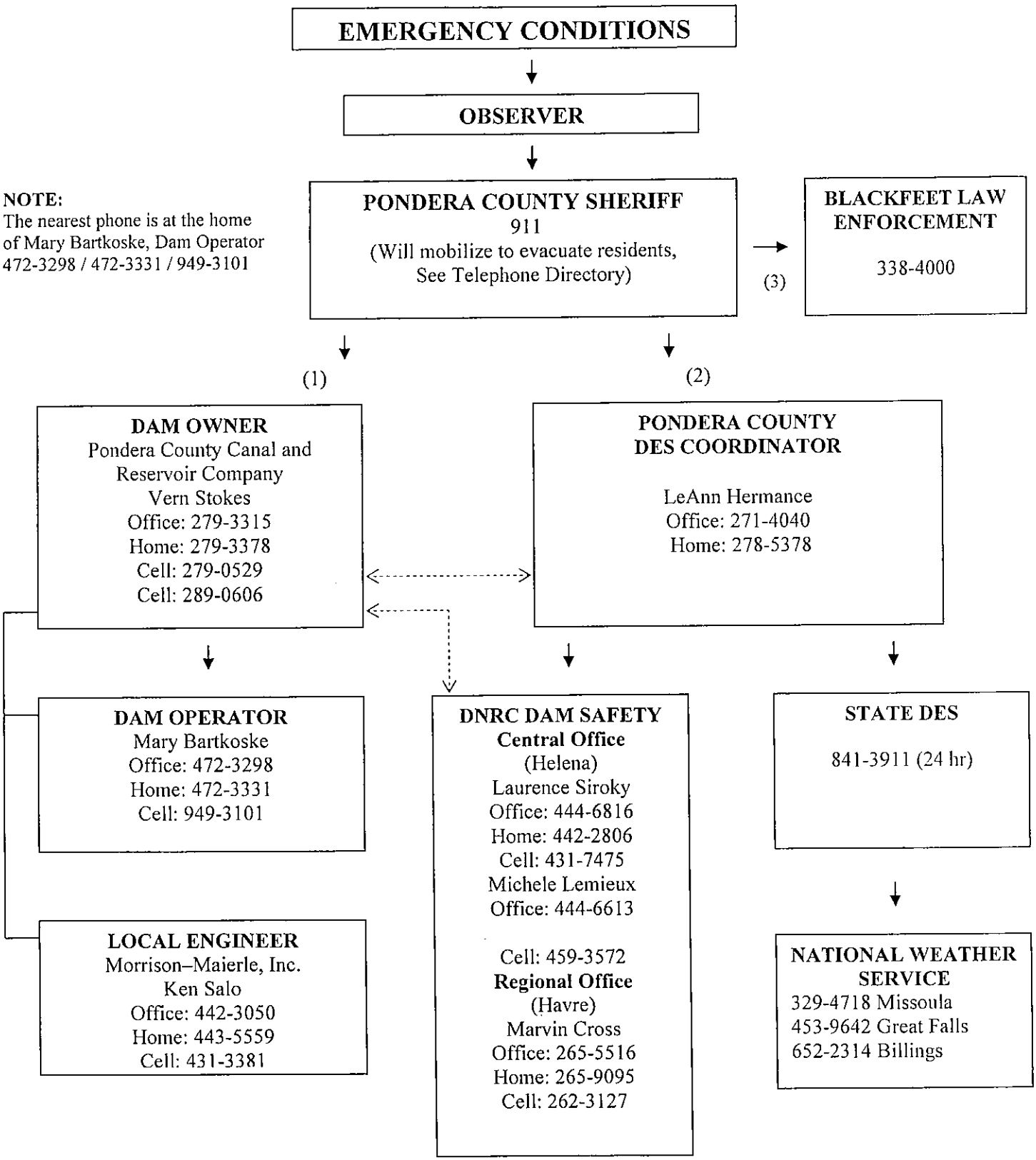
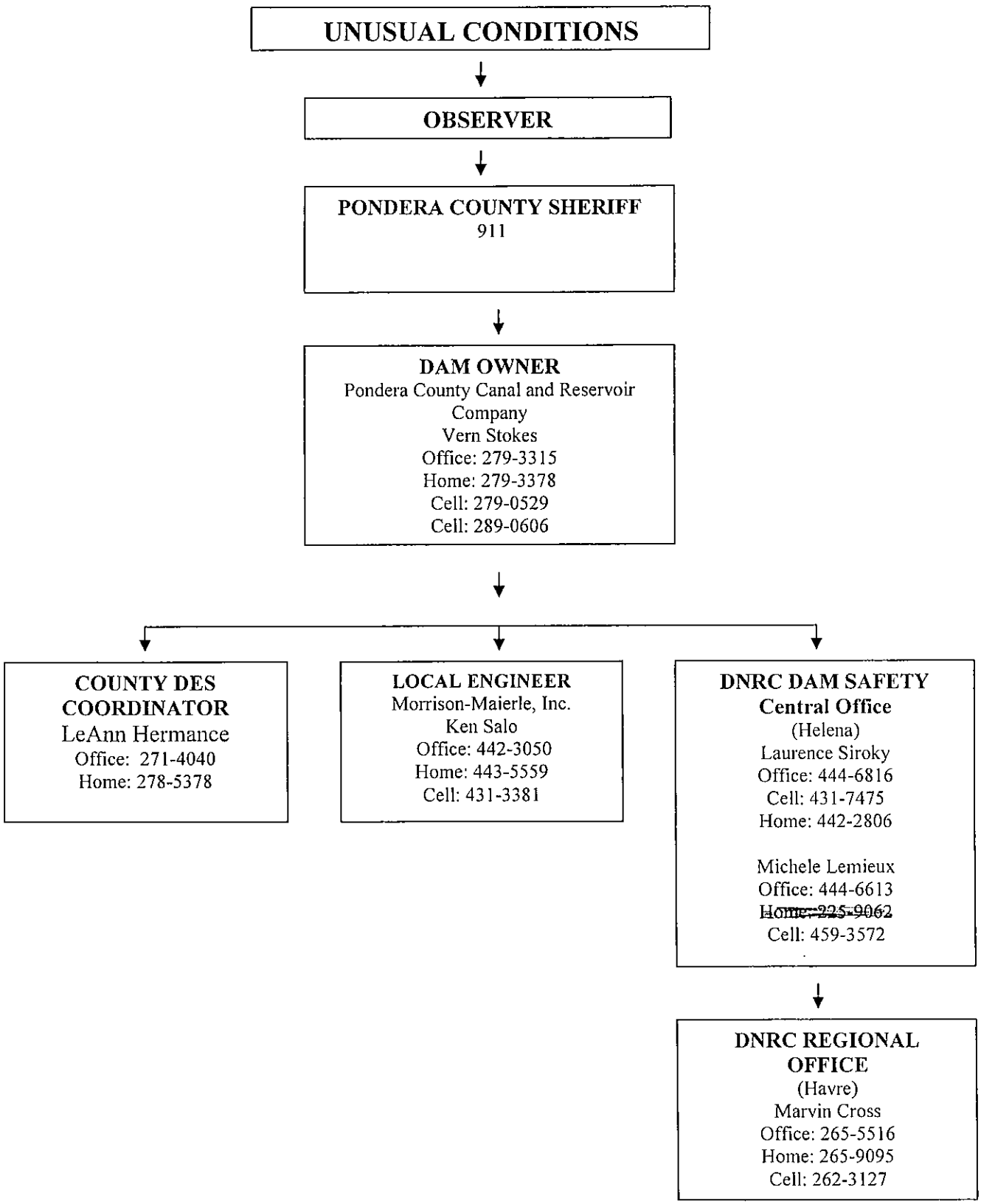


FIGURE 2
SWIFT DAM
POTENTIALLY HAZARDOUS SITUATION
"NOTIFICATION FLOW CHART"



2.3 WHAT THE DAM OWNER SHOULD DO

If you discover an unusual condition of the dam embankment that could threaten the structure:

A. Have a qualified engineer inspect the dam as soon as possible to determine whether emergency action is necessary.

B. Notify the county Disaster and Emergency Services Coordinator of the potential problem.

C. Contact the Department of Natural Resources and Conservation (DNRC) Dam Safety Section.

2.4 CONDITIONS TO WATCH FOR

Among the conditions you should watch for are: overtopping of the dam by flood waters; loss of material from the dam crest due to storm wave erosion; slides on either the upstream or downstream slope of embankment as evidenced by sloughing, cracking, bulging, or scarping of the embankment; erosional flows through, beneath, or around the embankment as evidenced by excessive seepage, discolorment of the seepage, boils on the downstream side, sinkholes, changes in piezometer levels or changes in the flow from drains; failure of outlets or spillways due to clogging or erosion; movement of the dam on its foundation as evidenced by misalignment, settlement, or cracking; or loss of abutment support as evidenced by cracking in concrete dams.

2.5 REQUIRED DATA FORMS

When you call either an engineer or the DNRC to report a problem, use the form in Appendix A to ensure you can provide sufficient information for the engineer to analyze the problems. In addition, prepare a sketch showing the extent of the problem. Revise the sketch periodically if the problem develops further. Section III includes further guidelines for courses of action to take to mitigate the effect of many problems.

2.6 POSTING THE NOTIFICATION FLOWCHART AND DISTRIBUTION OF EAP

The notification flowchart is posted at the dam and a copy of the EAP is in the gatehouse. The Pondera County Sheriff's Office and the Pondera County DES Coordinator have copies of the plan.

2.6.1 Telephone Directory

2.6.1.1 First Priority

A. SHERIFF
Pondera County 911

B. BLACKFEET LAW ENFORCEMENT 338-4000

C. DISASTER AND EMERGENCY SERVICES
Pondera County Office 271-4040
Home 278-5378

Montana Disaster and Emergency Services
Division (Helena) 841-3911

D. EVACUEES (in order of evacuation)

1	Steve Johnson, 17512 Swift Dam Road	472-3274
1	Frank Johnson, 18364 Swift Dam Road	472-3319
3	Jay Hardman, 4070 Distant Road	472-3333
4	Don Reishus, 10635 Seven Mile Road	472-3356
5	Lawrence Salois, 12603 Heart Butte Road	No Phone
6	Duane & Roberta Rutherford, 12067 Heart Butte Road	472-3335
7	Herman Shult, 11813 Heart Butte Road	472-3302
8	Yvonne Augare	279-3461
8	Eloise England, 10919 Birch Creek	472-3364
8	Michael Campbell, Wanda England, 10156 Birch Creek Road	472-3374
9	Pat Hall, 10155 Birch Creek Road	472-3366
9	Larrie & Carol Bunyan, 8998 Birch Creek Road	472-3201
10	Wallace & Marisha Hall, 546 Big Rock Ln.	472-3378
	Vacant (Wallace & Marisha Hall), 530 Big Rock Ln.	Vacant
	Donald & Rebecca Running Crane, 515 Big Rock Lane	472-3258
11	Terri Wood, 285 Goose Lane	472-3227
12	Lloyd Tatsey, 5537 Birch Creek Road	No Phone
	Mike Tatsey, 4775 Birch Creek Road	472-3398
	John & Lisa Hall, 3819 Birch Creek Road	472-3308
	Blackfoot Tribe	Vacant
	Forrest Boss Ribs, 2563 Birch Creek Road	472-3255
	Leo & Dorothy Flammand, 2225 Birch Creek Road	472-3264
16	Web Pepion, 499 Birch Creek Road	472-3355
	Pete Bradley, 904 Robere Road	472-3387
17	Wallace Bradley, 826 Robere Road	472-3303
	Junior Pepion, 94 Medicine Lodge Lane	No Phone
	Susie Pepion, 98 Medicine Lodge Lane	472-3228
	Karley Pepion, 247 Medicine Lodge Lane	472-3206
18	Terry Onstad, 85872 US Highway 89	472-3397
19	Broken Pick Ranch	472-3210
20	Tom Kuka, 589 Silver Lane	472-3253
20	Vern & Marie Kuka, 357 Silver Lane	472-3363
21	US Highway 89	
23	Trent Stoltz, 2601 Stoltz Road	472-3386
	Vacant, 2770 Stoltz Road	
23	Kingsbury Colony, 2100 Stoltz Road	472-3345
23	Merv & Diana Felton, 1524 Cedar Lane	472-3389
24	Ruby Pearl Harrington, 1529 Cedar Lane	
24	Brent & Joann Gaylord, 1919 Gaylord Road	472-3222
25	Shawn McLean, 7220 Valier - Cut Bank Hwy.	279-3221
26	Clay & Ann McAlpine, 18566 Bullhead Road	279-3570
30	Kingsbury Colony, 600 Kingsbury Colony Road	472-3285

2.6.1.2 Second Priority

E. MONTANA DEPT. OF NATURAL RESOURCES AND CONSERVATION (DNRC)

Dam Safety Section, Laurence Siroky ...	Office	444-6816
	Home	442-2806
	Cell	431-7475
Dam Safety Section, Michele Lemieux...	Office	444-6613
	Home	225-9062
	Cell	459-3572
Regional Office, Marvin Cross	Office	265-5516
	Home	265-9095
	Cell	262-3127

F. MORRISON-MAIERLE, INC.

Ken Salo	Office	442-3050
	Home	443-5559
	Cell	431-3381

G. NATIONAL WEATHER SERVICE

Missoula 329-4718

Great Falls... 453-9642

Billings 652-2314

H. BUREAU OF RECLAMATION

Tim Felchle 247-7614

I. MONTANA DEPARTMENT OF FISH, WILDLIFE AND PARKS 444-2535

2.7 EVACUATION PROCEDURES

The areas requiring evacuation are shown on the dambreak flood inundation mapping included in Appendix B. This inundation is based upon a clear weather dambreak or on not occurring during a major flood event. The dambreak flooding will travel quickly with an average speed of 20 miles per hour and range in depth from 25 to 90 feet.

When failure is imminent or has occurred, evacuees should be instructed to proceed directly to high ground and to avoid the Birch Creek valley. Because of the quickness and depth of the dambreak, there is a tremendous threat to life. Therefore, the most important consideration is to get to a safe location and possessions and livestock should be left behind.

When an unusual occurrence has developed, the need for evacuation and the urgency of evacuation should be based on the seriousness of the problem. If deemed appropriate, a slower evacuation using normal access routes may be used.

The evacuee list shown on page 9 is a list of residences on or near Birch Creek starting at the dam and proceeding in order downstream to the confluence with the Marias River. A general evacuation order should be issued to residents along the floodplain of the Marias River.

2.8 EXAMPLE EMERGENCY BROADCAST SYSTEM ANNOUNCEMENT

2.8.1 Example when failure is imminent or has occurred:

ATTENTION: THIS IS AN EMERGENCY MESSAGE FROM THE _____ DEPARTMENT. LISTEN CAREFULLY. YOUR LIFE MAY DEPEND ON IMMEDIATE ACTION. SWIFT DAM LOCATED ON BIRCH CREEK HAS FAILED. REPEAT: SWIFT DAM ON BIRCH CREEK HAS FAILED. IF YOU LIVE IN OR NEAR THE BIRCH CREEK VALLEY PROCEED IMMEDIATELY TO HIGH GROUND AWAY FROM THE STREAM VALLEY. DO NOT TRAVEL IN THE BIRCH CREEK VALLEY OR RETURN TO THE BIRCH CREEK VALLEY FOR POSSESSIONS. YOU CANNOT OUTRUN OR DRIVE AWAY FROM THE FLOOD WAVE. PROCEED IMMEDIATELY TO HIGH GROUND AWAY FROM THE STREAM VALLEY. (repeat message)

3 MITIGATION ACTIONS

Besides normal monitoring of the dam's condition which is done at least monthly, the owner will provide continuous monitoring and inspection during and after extreme events such as storms and earthquakes. The magnitude of an earthquake or storm can be obtained from DNRC Dam Safety, 444-6816 or 431-7475. Actions suggested to mitigate problems that develop should never be continued at the risk of injury or at the expense of lessening efforts related to evacuation. Monitoring should identify any of the following potential problems.

3.1 POTENTIAL PROBLEMS AND POSSIBLE IMMEDIATE RESPONSE ACTIONS

3.1.1 Overtopping by flood waters

A. Open outlet to its maximum safe capacity.

B. Place sandbags along the crest to increase freeboard and force more water through the spillway and outlet.

C. Provide erosion-resistant protection to the downstream slope by placing plastic sheets or other materials over eroding areas.

D. Divert flood waters around the reservoir basin if possible.

E. Create additional spillway capacity by making a controlled breach in a low embankment or dike section where the foundation materials are erosion resistant.

3.1.2 Loss of dam cross section due to storm wave erosion

A. Place additional riprap or sandbags in damaged areas to prevent further embankment erosion.

B. Lower the water level to an elevation below the damaged area.

3.1.3 Landslides in the dam embankment

A. Lower the water level at a rate and to an elevation considered safe given the slope condition. If the outlet is damaged or blocked, pumping, siphoning, or a controlled breach may be required.

B. Stabilize slides on the downstream slope by weighting the toe area with additional soil, rock, or gravel and then restore lost freeboard by placing sandbags at crest.

3.1.4 Seepage through the embankment, foundation, or abutments

A. Plug the flow with whatever material is available (hay bales, bentonite, or plastic sheeting if the entrance to the leak is in the reservoir basin).

B. Lower the water level until the flow decreases to a non-erosive velocity or until it stops.

C. Place a protective sand and gravel filter or boil ring over the exit area to hold materials in place.

3.1.5 Failure of appurtenant structures such as outlets or spillways

A. Implement temporary measures to protect the damaged structure, such as closing an outlet or providing temporary protection for a damaged spillway.

B. Lower the water level to a safe elevation. If the outlet is inoperable, pumping, siphoning, or a controlled breach may be required.

3.1.6 Mass movement of the dam on its foundation, (spreading or mass sliding failure)

A. Immediately lower the water level until excessive movement stops.

3.1.7 Excessive seepage and high level saturation of the embankment

A. Lower the water to a safe level.

B. Continue frequent monitoring for signs of slides, cracking or concentrated seepage.

3.1.8 Spillway backcutting threatening reservoir evacuation

A. Reduce the flow over the spillway by fully opening the main outlet.

B. Provide temporary protection at the point of erosion by placing sandbags, riprap materials, or plastic sheets weighted with sandbags.

C. When the inflow subsides, lower the water to a safe level.

3.1.9 Excessive settlement of the embankment

A. Lower the water level by releasing it through the outlet or by pumping, siphoning, or a controlled breach.

B. If necessary, restore freeboard, preferably by placing sandbags.

3.1.10 Loss of abutment support or extensive cracking in concrete dams

A. Lower the water level by releasing it through the outlet.

B. Attempt to block water movement through the dam by placing plastic sheets on the upstream face.

3.1.11 Earthquake Zone

Swift Dam is located in a area subject to earthquakes of moderate (zone 2) damaging intensity. If you have felt an earthquake or one has been reported to have occurred in the area with a Richter magnitude of 4.0 or greater within a 30 miles radius, 5.5 or greater within 90 miles, or 6.5 or greater within a 180 mile radius from the site, follow the following procedures:

A. Immediately conduct a general overall visual inspection of the dam.

B. Perform field survey to check targets located on dam per Section 4.0 of Standard Operating Procedures.

C. Drain reservoir as required.

3.2 EMERGENCY SUPPLIES AND RESOURCES

In the vicinity of Swift Dam are soils and rock suitable for emergency repairs. Selected areas of the plains along the access road to the dam are composed of clayey, silty soil that should be fairly impermeable. Downstream from the reservoir in and along the stream channel are sands and gravels. Riprap rock is available below the dam and in the surrounding hills.

3.3 LOCAL CONTRACTORS AND ENGINEERS

Pondera County Canal and Reservoir Company 279-3315

Pondera County Road Department 279-3651

Garman Construction 278-7790

Sullivan Brothers Construction 278-7940

APPENDICES

APPENDIX A
DAM INCIDENT REPORT FORM

APPENDIX A
DAM INCIDENT REPORT FORM

DATE_____TIME_____

NAME OF DAM_____

STREAM LINE_____

LOCATION _____

COUNTY _____

OBSERVER _____

OBSERVER TELEPHONE _____

NATURE OF PROBLEM _____

_____

LOCATION OF PROBLEM AREA (Looking Downstream) _____

_____

EXTENT OF PROBLEM AREA _____

_____

FLOW QUANTITY AND COLOR _____

WATER LEVEL IN RESERVOIR _____

WAS SITUATION WORSENING? _____

EMERGENCY STATUS _____

CURRENT WEATHER CONDITIONS _____

ADDITIONAL COMMENTS _____

_____

_____

APPENDIX B
INUNDATION AND EVACUATION MAPS

D. EVACUEES (in order of evacuation)

1	Steve Johnson, 17512 Swift Dam Road	472-3274
1	Frank Johnson, 18364 Swift Dam Road	472-3319
3	Jay Hardman, 4070 Distant Road	472-3333
4	Don Reishus, 10635 Seven Mile Road	472-3356
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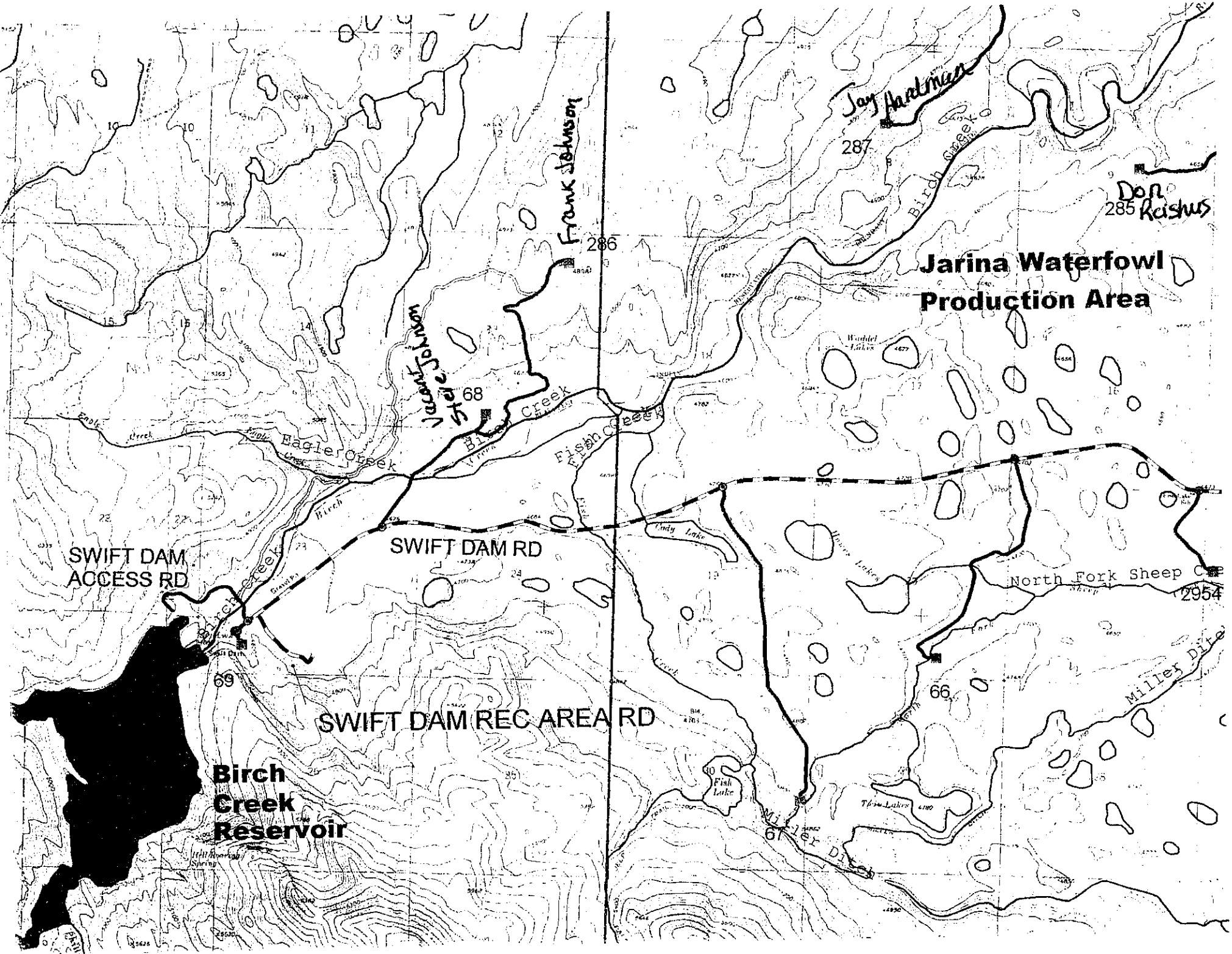
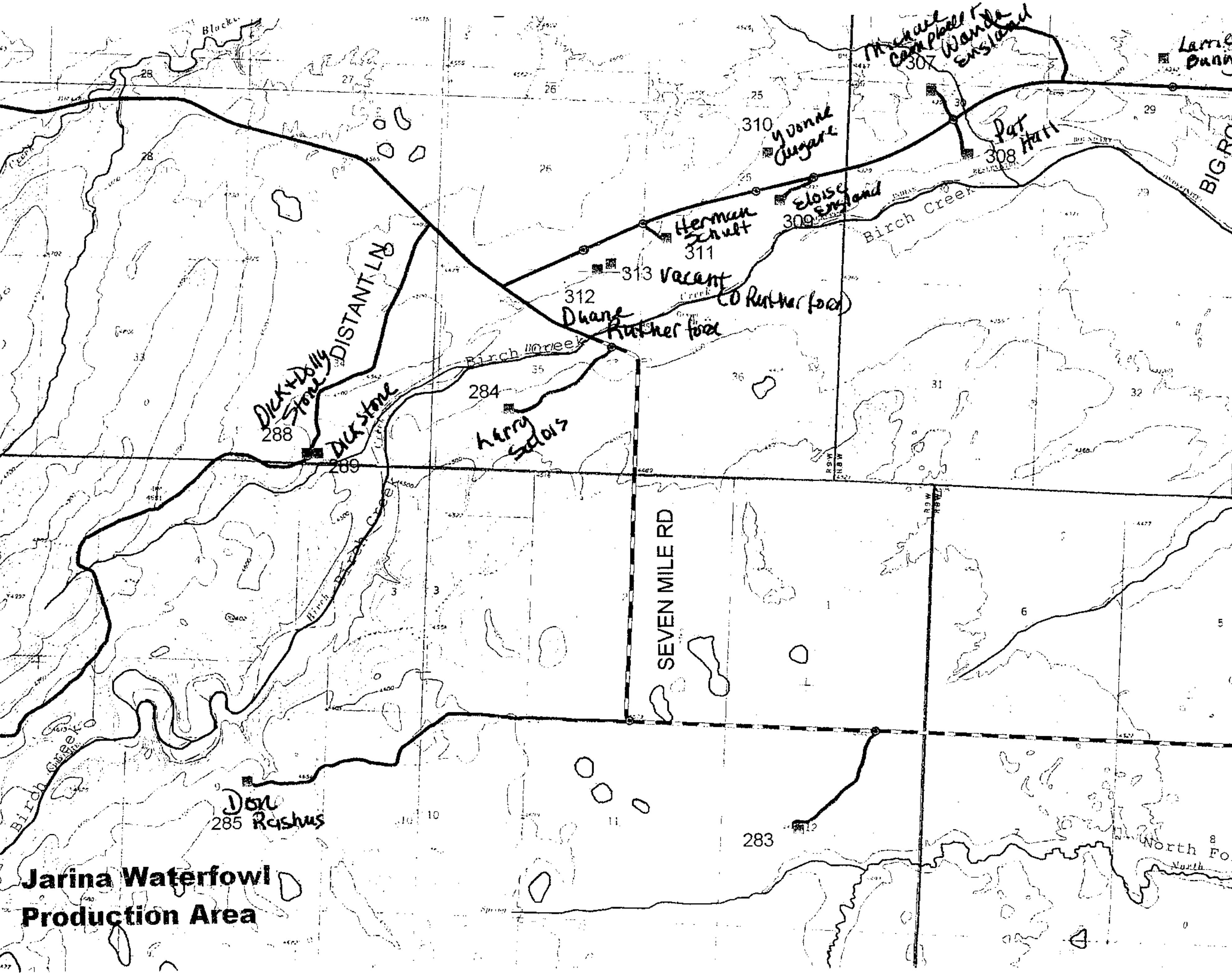
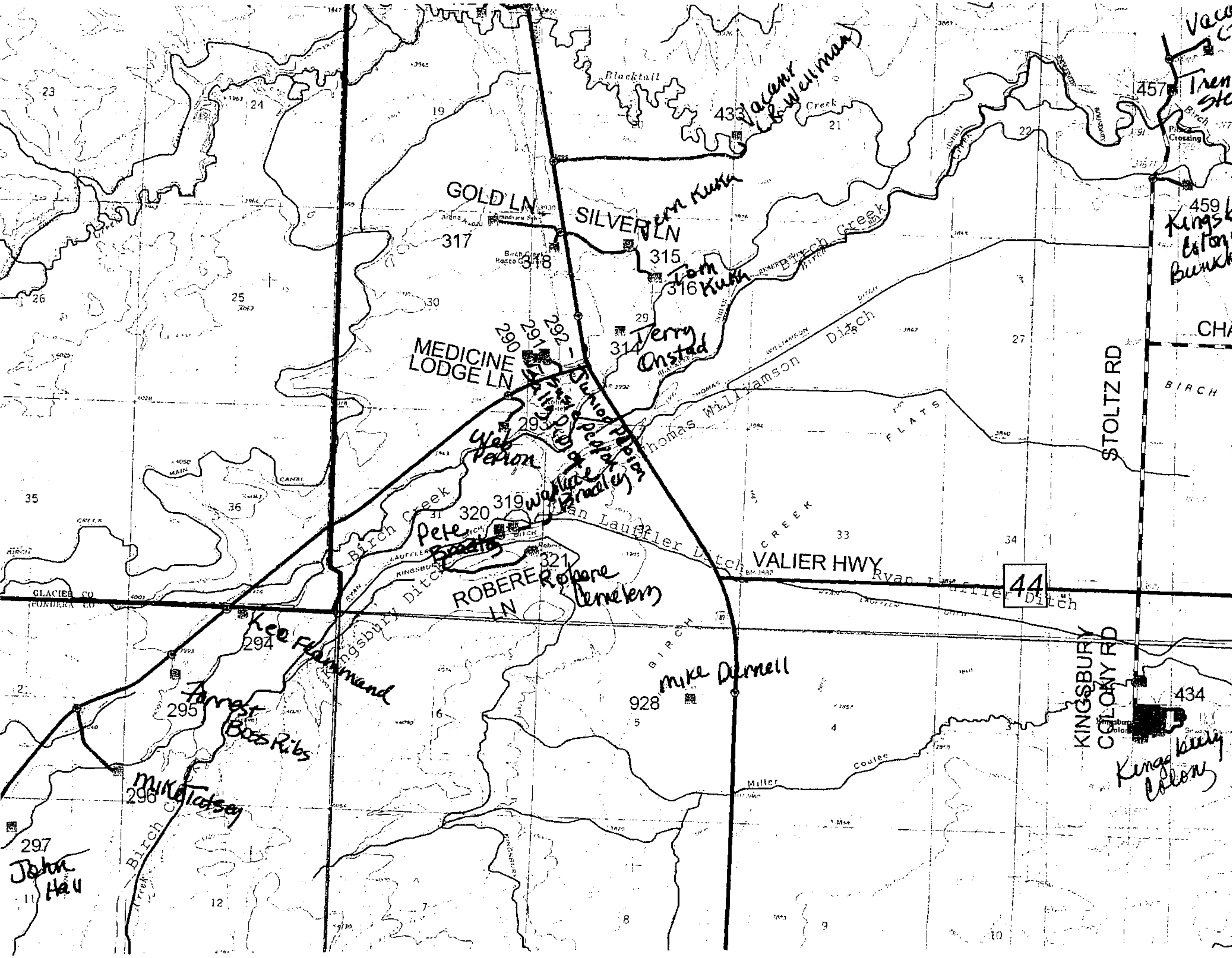
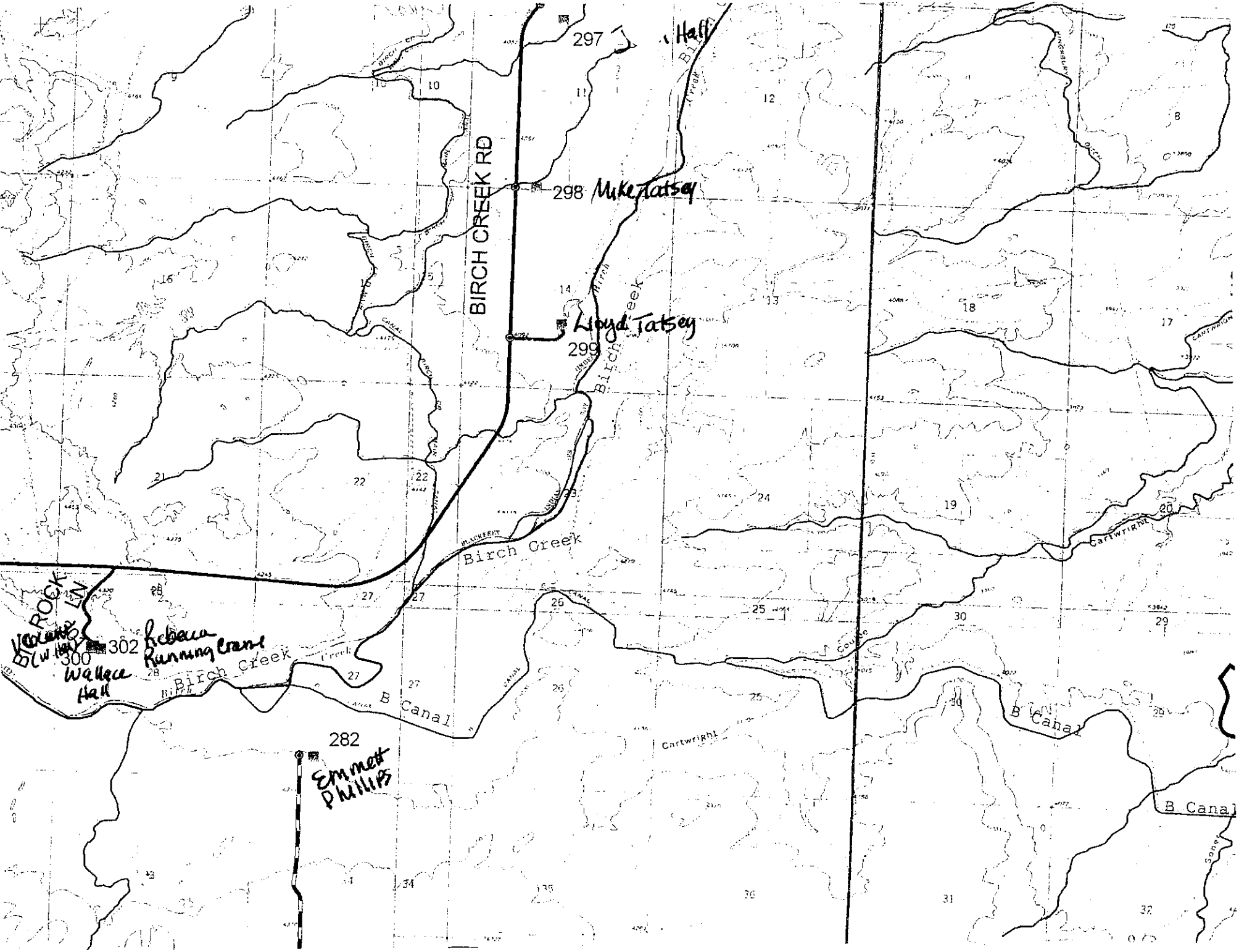
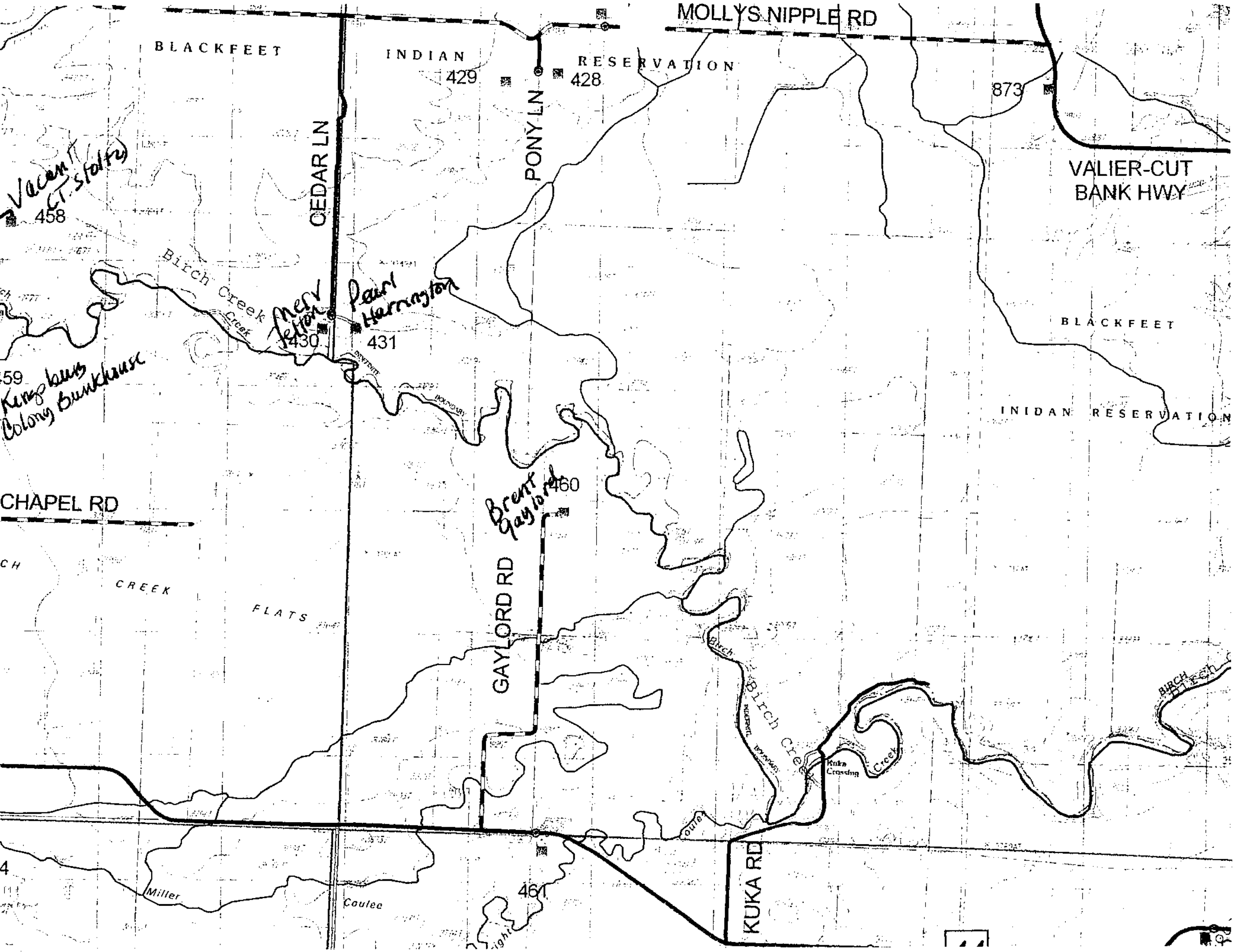
20	Vern & Marie Kuka, 357 Silver Lane	472-3363
21	US Highway 89	
23	Trent Stoltz, 2601 Stoltz Road	472-3386
	Vacant, 2770 Stoltz Road	
23	Kingsbury Colony, 2100 Stoltz Road	472-3345
23	Merv & Diana Felton, 1524 Cedar Lane	472-3389
24	Ruby Pearl Harrington, 1529 Cedar Lane	
24	Brent & Joann Gaylord, 1919 Gaylord Road	472-3222
25	Shawn McLean, 7220 Valier - Cut Bank Hwy.	279-3221
26	Clay & Ann McAlpine, 18566 Bullhead Road	279-3570
30	Kingsbury Colony, 600 Kingsbury Colony Road	472-3285

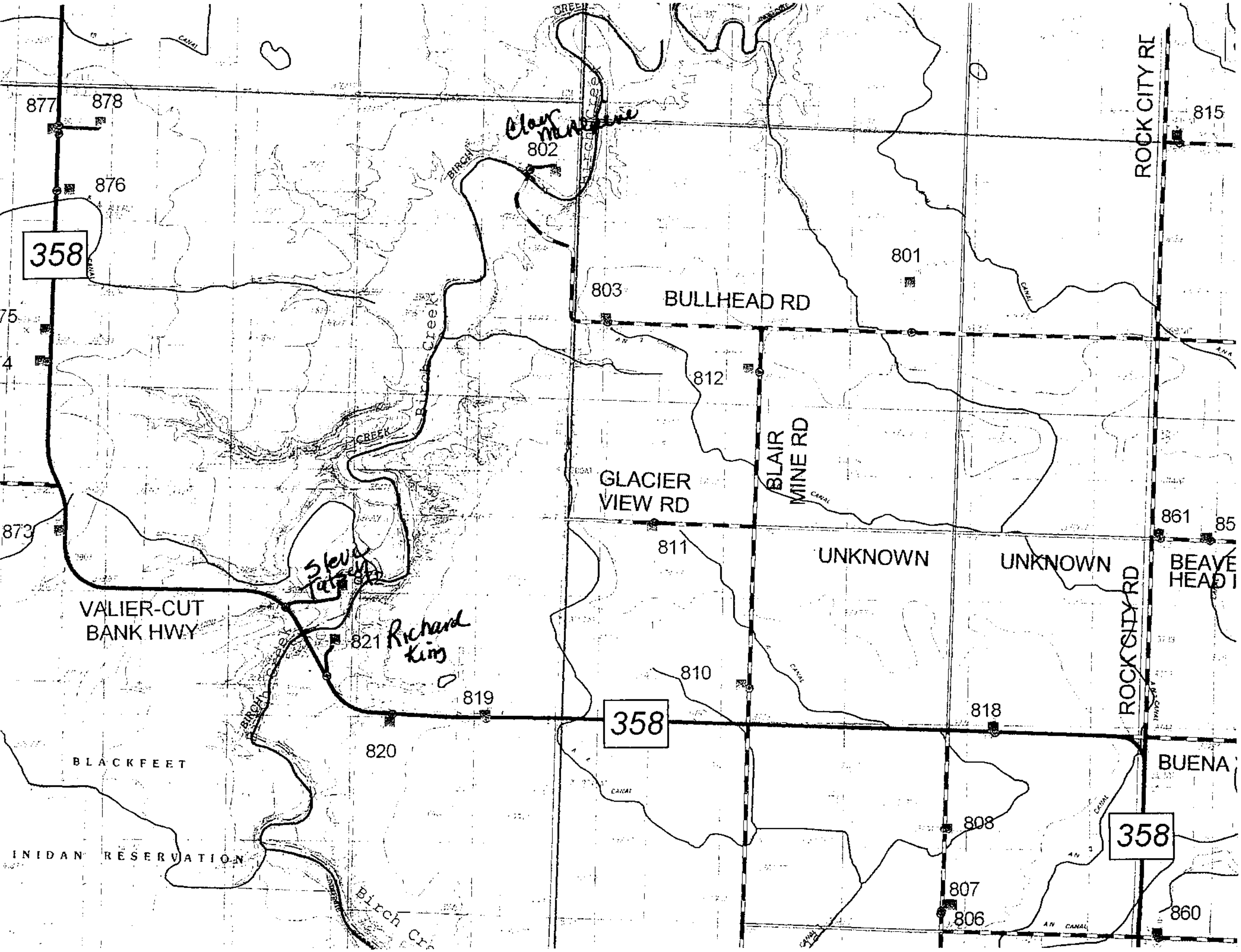

Jay Hardman
287
Don Raishus
285
Frank Johnson
286
Jarina Waterfowl
Production Area
Vacant Johnson Star
68
Eagle Creek
Birch Creek
Fish Creek
SWIFT DAM
ACCESS RD
SWIFT DAM RD
North Fork Sheep Cr
2954
69
66
SWIFT DAM REC AREA RD
Birch
Creek
Reservoir
Fish
Lake
67
Miller Ditch


Jarina Waterfowl Production Area
SEVEN MILE RD
DISTANT LN
Birch Creek
BIG RO
North For
313
312
311
310
309
308
307
288
289
284
285
283


GOLD LN
SILVER LN
MEDICINE LODGE LN
ROBERE LN
VALIER HWY
STOLTZ RD
KINGSBURY COLONY RD
44
Blacktail Creek
Birch Creek
Thomas Williamson Ditch
Ryan Lauffler Ditch
Van Lauffler Ditch
Kingsbury Ditch
FLATS
Miller Coulee
Pondera Crossing
GLACIER CO
PONDERA CO
290
291
292
293
294
295
296
297
314
315
316
317
318
319
320
321
433
434
457
459
928


297
298 Mike Tatsey
299 Lloyd Tatsey
BIRCH CREEK RD
Birch Creek
Birch Creek
Birch Creek
B Canal
B Canal
B Canal
Cartwright
Cartwright
300 Wallace Hall
302 Rebecca Running Crane
282 Emmett Phillips


MOLLYS NIPPLE RD
BLACKFEET INDIAN RESERVATION
429
428
873
CEDAR LN
PONY LN
VALIER-CUT BANK HWY
Vacant C.T. Stoltz
458
Birch Creek
Merv Felton
430
Paul Harrington
431
BLACKFEET INIDAN RESERVATION
King Colony Bunkhouse
CHAPEL RD
Brent Gaylord
460
CREEK FLATS
GAYLORD RD
Birch Creek
Kuka Crossing
Creek
BIRCH
Coulee
Miller
461
KUKA RD


358
877
878
876
802
803
801
815
BULLHEAD RD
812
BLAIR MINE RD
GLACIER VIEW RD
811
810
UNKNOWN
UNKNOWN
ROCK CITY RD
ROCK CITY RD
861
BEAVER HEAD
BUENA
818
819
820
821
808
807
806
860
873
VALIER-CUT BANK HWY
BLACKFEET
INIDAN RESERVATION
Birch Creek
CANAL
Richard King

APPENDIX C
Technical Data For Swift Dam

APPENDIX C
Technical Data for Swift Dam

Maximum Reservoir Capacity at Crest of the Dam: 33,890 acre-ft

Normal Reservoir Capacity Measured to the Emergency Spillway Crest: 22,975 acre/ft

MAIN DAM

Normal Water Depth Measured from Streambed to the Crest of the Emergency Spillway: 162 ft

Normal Reservoir Surface Area: 379 acres

Dam Height Measured From the Streambed to the Crest of the Dam: 170.5 ft

Dam Crest Width: 9 ft

Dam Width at Base: 22 ft

Length of Dam: 560 ft

Outlet Capacity: 2,580 cfs

Spillway Capacity: 33,700 cfs

Date Constructed: 1967

DIKE

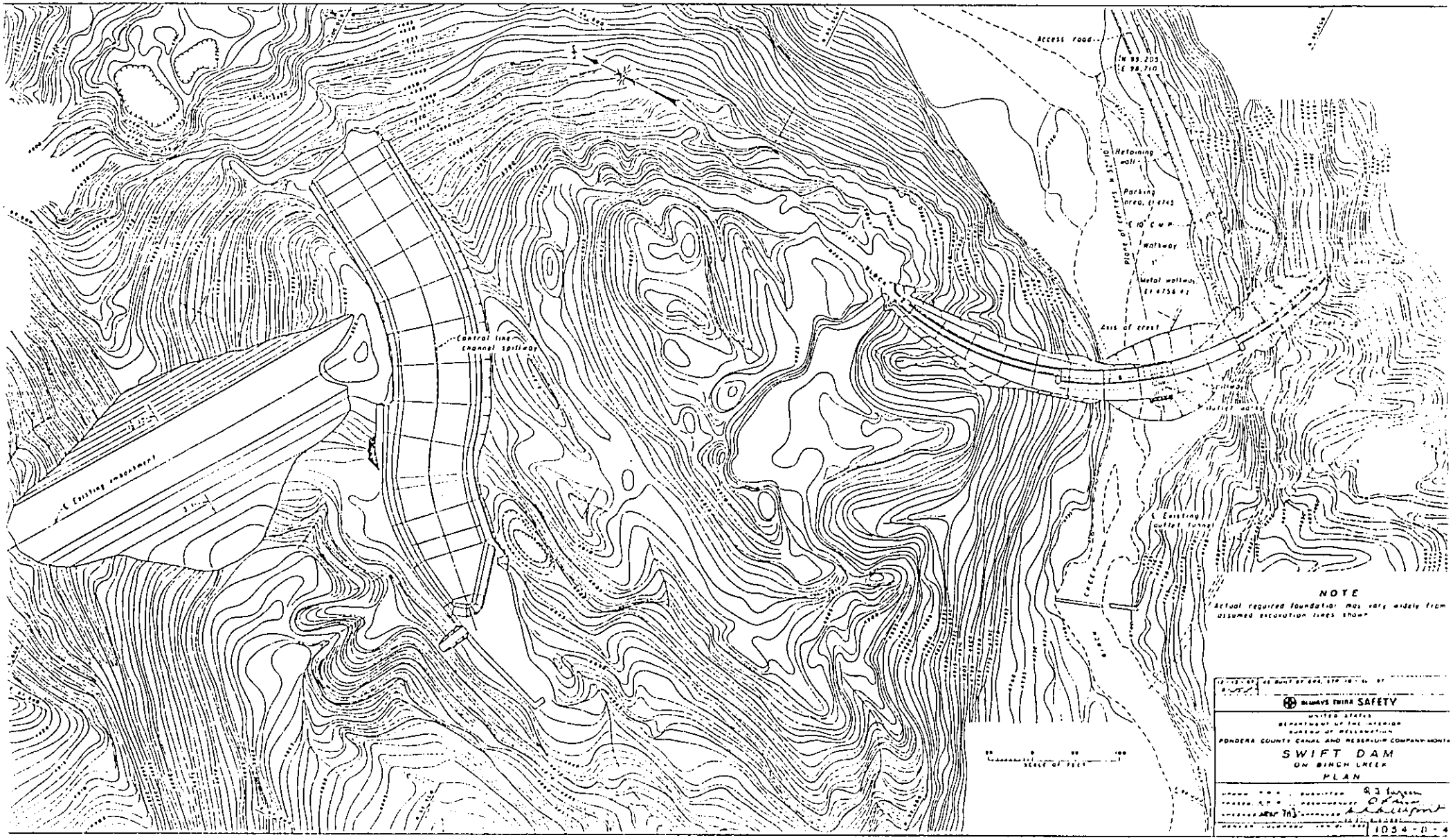
Dike Height: 42 feet

Crest Width: 70 feet

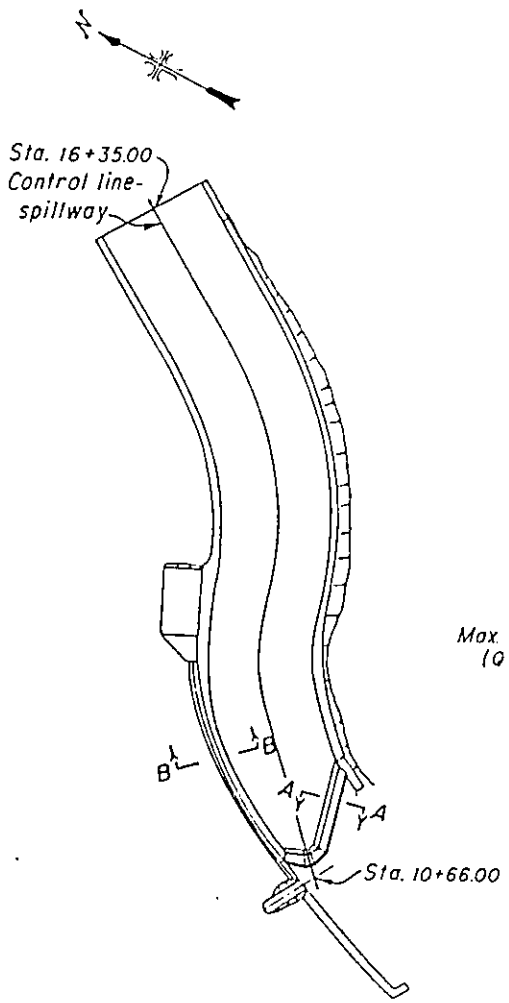
Crest Length: 450 feet

Base Width: 200 feet

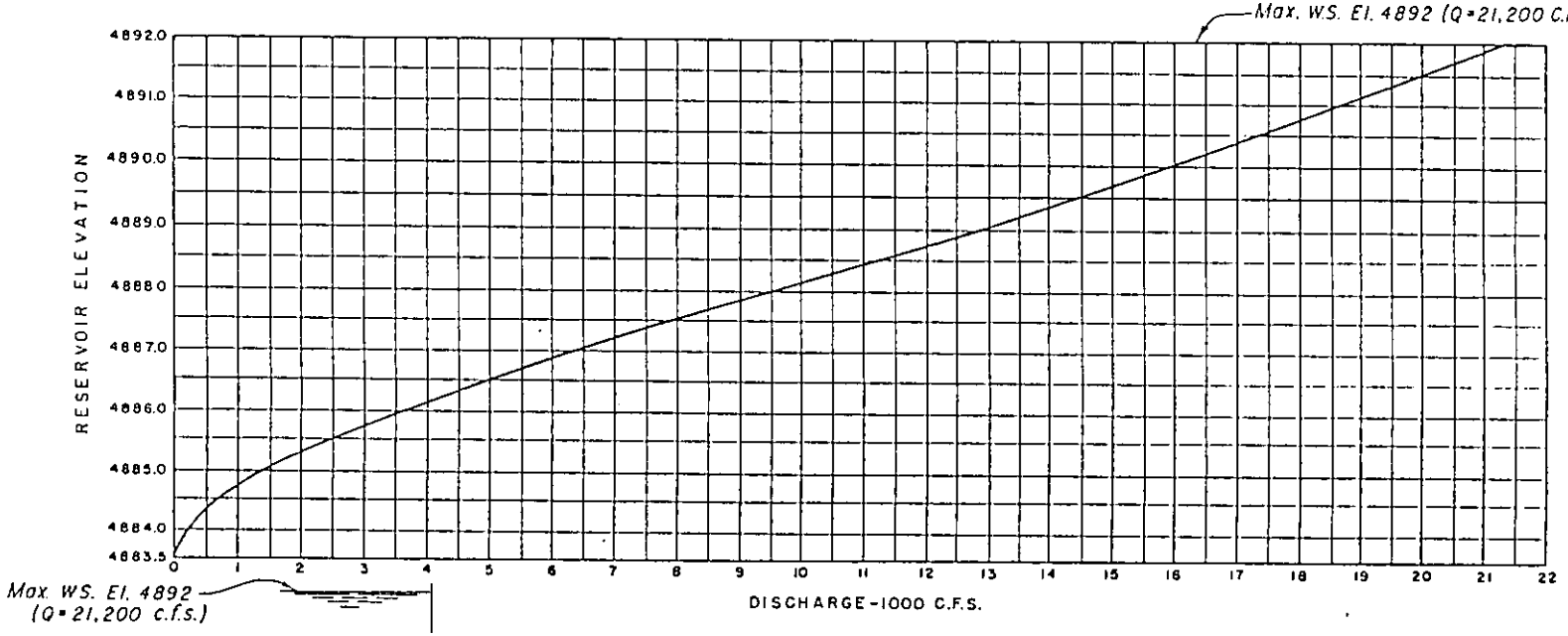
DAM STRUCTURE

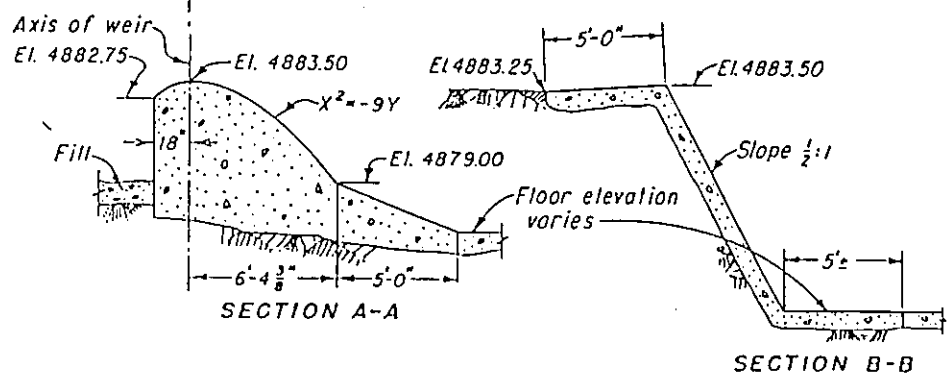

Access road
Retaining wall
Parking area
Walkway
Metal walkway
Axis of crest
Central line channel spillway
Existing embankment
Existing outlet tunnel
Creek
SCALE OF FEET
NOTE
Actual required foundation may vary widely from assumed excavation lines shown
SAFETY
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PONDERA COUNTY CANAL AND RESERVOIR COMPANY-MONTA
SWIFT DAM
ON BIRCH CREEK
PLAN
1054-D-4

SPILLWAY STRUCTURE



PLAN





SECTION A-A

SECTION B-B

ALWAYS THINK SAFETY

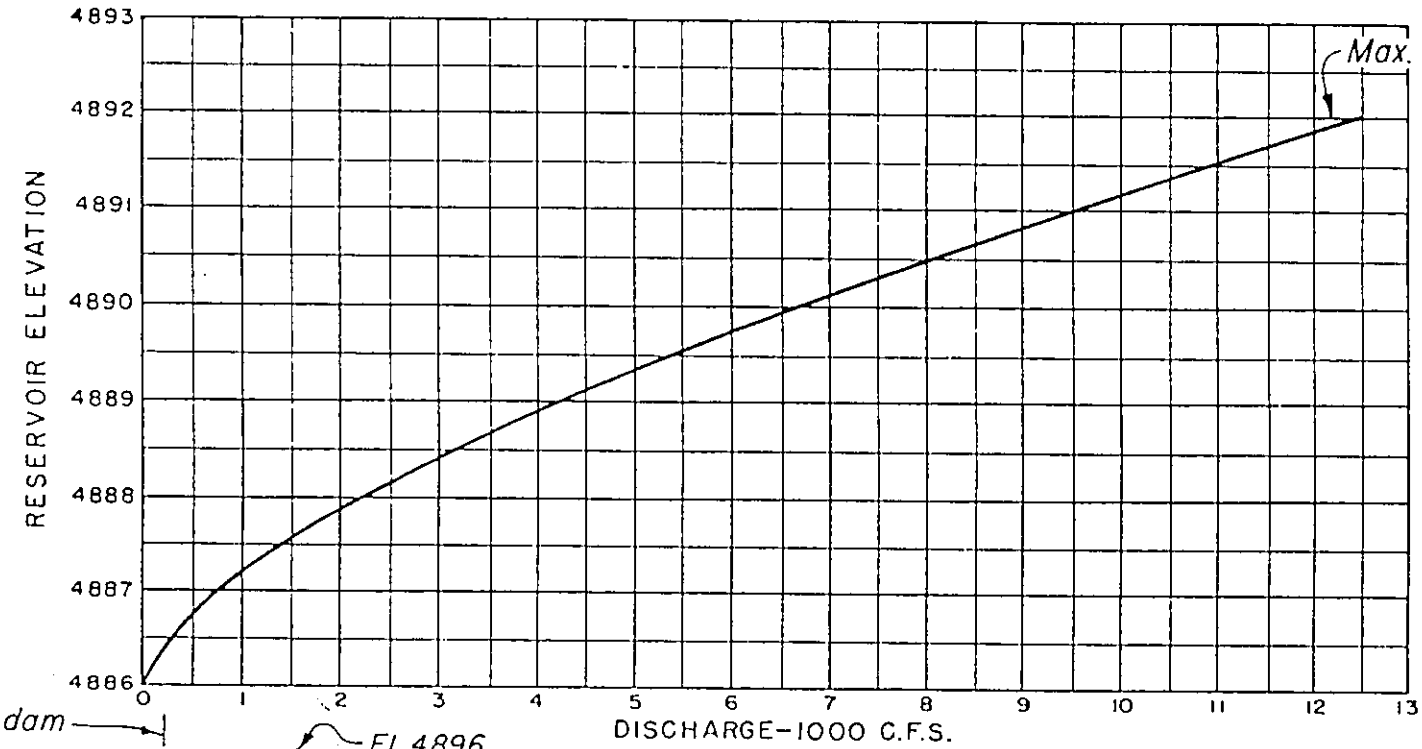
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PONDERA COUNTY CANAL
AND RESERVOIR COMPANY-MONTANA

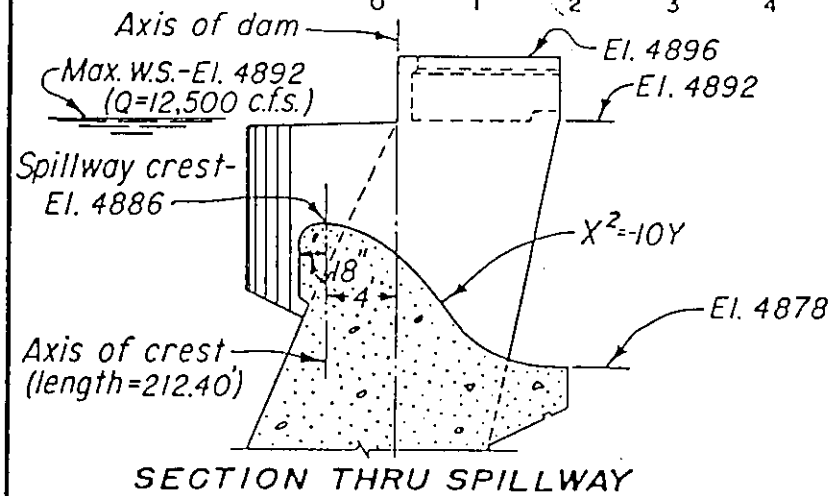
SWIFT DAM
ON BIRCH CREEK
CHANNEL SPILLWAY-DISCHARGE CURVE

DRAWN ... SUBMITTED ...
TRACED ... RECOMMENDED ...
CHECKED ... APPROVED ... CHIEF, DAMS BRANCH

DENVER, COLO., DEC. 30, 1940

1054-D-82





SECTION THRU SPILLWAY

ALWAYS THINK **SAFETY**

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PONDERA COUNTY CANAL
AND RESERVOIR COMPANY- MONTANA

SWIFT DAM
ON BIRCH CREEK
SPILLWAY OVER DAM-DISCHARGE CURVE

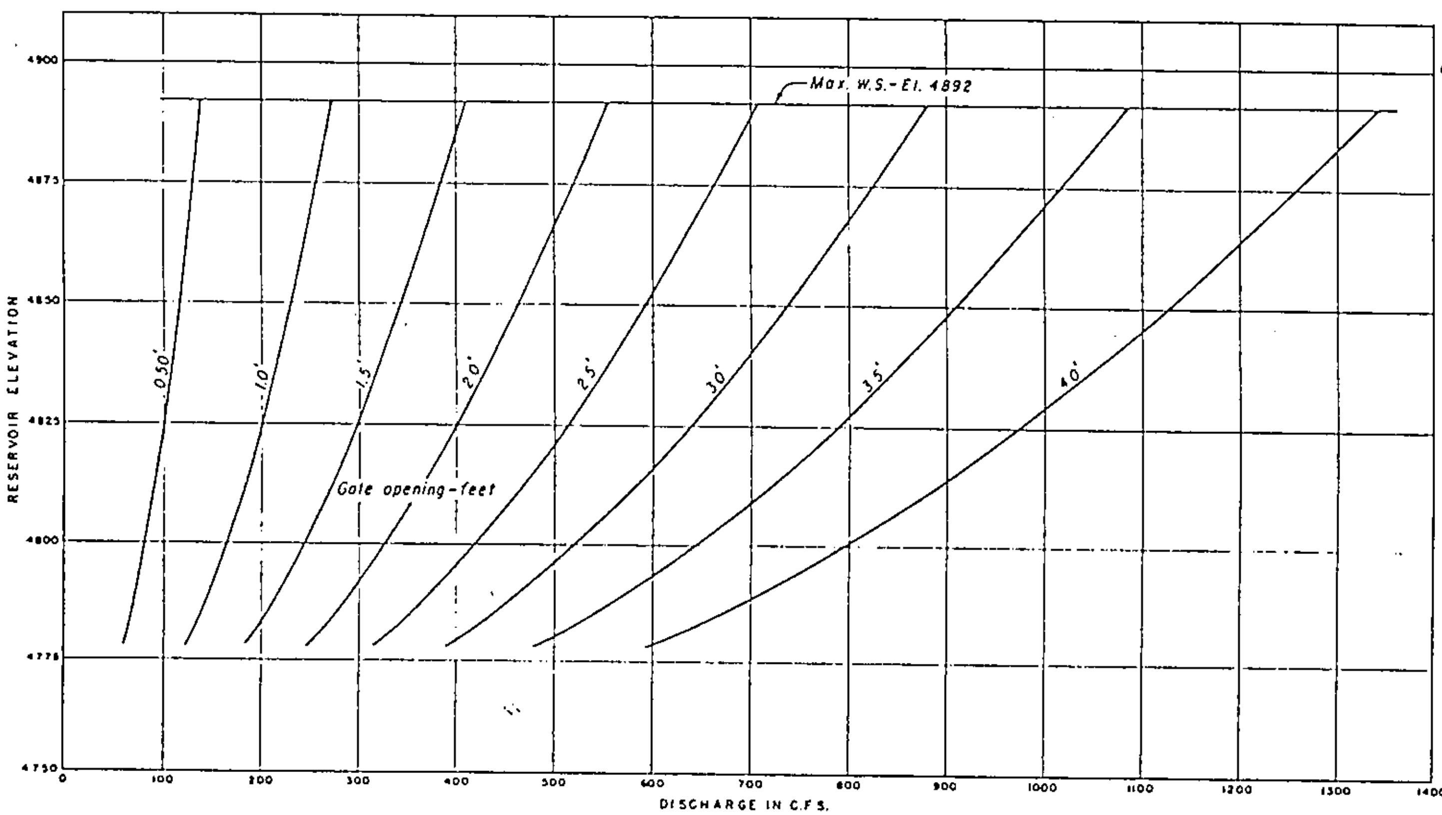
DRAWN K.G.B. SUBMITTED. L. A. Engelhardt
TRACED F.M.K. RECOMMENDED. C. J. Larsen
CHECKED J.A. APPROVED. R. J. Larsen
CHIEF, DAMS BRANCH

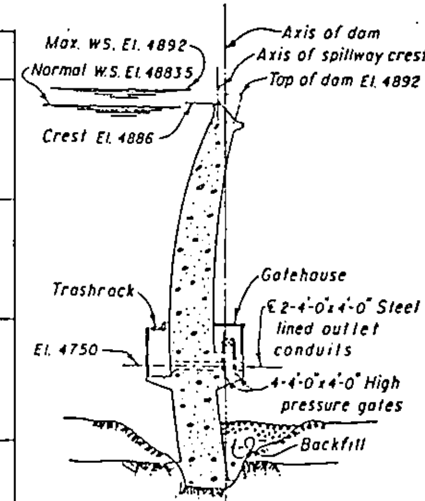
DENVER, COLO., DEC. 30, 1944

1054-D-83

OUTLET STRUCTURE

\eap3.sw\





SECTION THRU ℄ OUTLET WORKS

NOTES

Gate opening is measured vertically on the regulating gate gage.
Curves shown for discharge of one outlet conduit.

ALWAYS THINK SAFETY

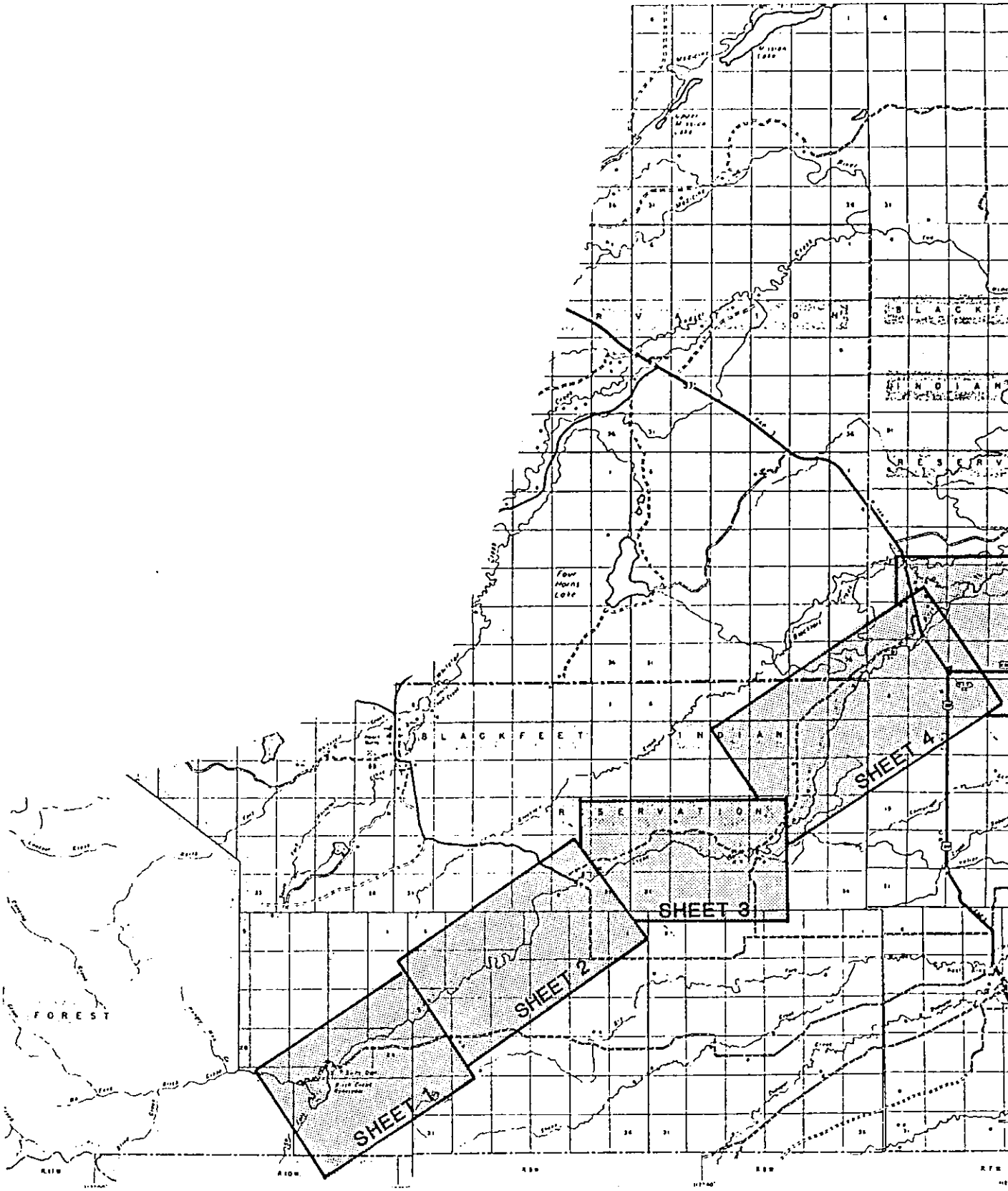
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
PONDERA COUNTY CANAL AND RESERVOIR COMPANY-MONTANA

SWIFT DAM
ON BIRCH CREEK
OUTLET WORKS
DISCHARGE CURVES
4'-0"x4'-0" HIGH PRESSURE GATE

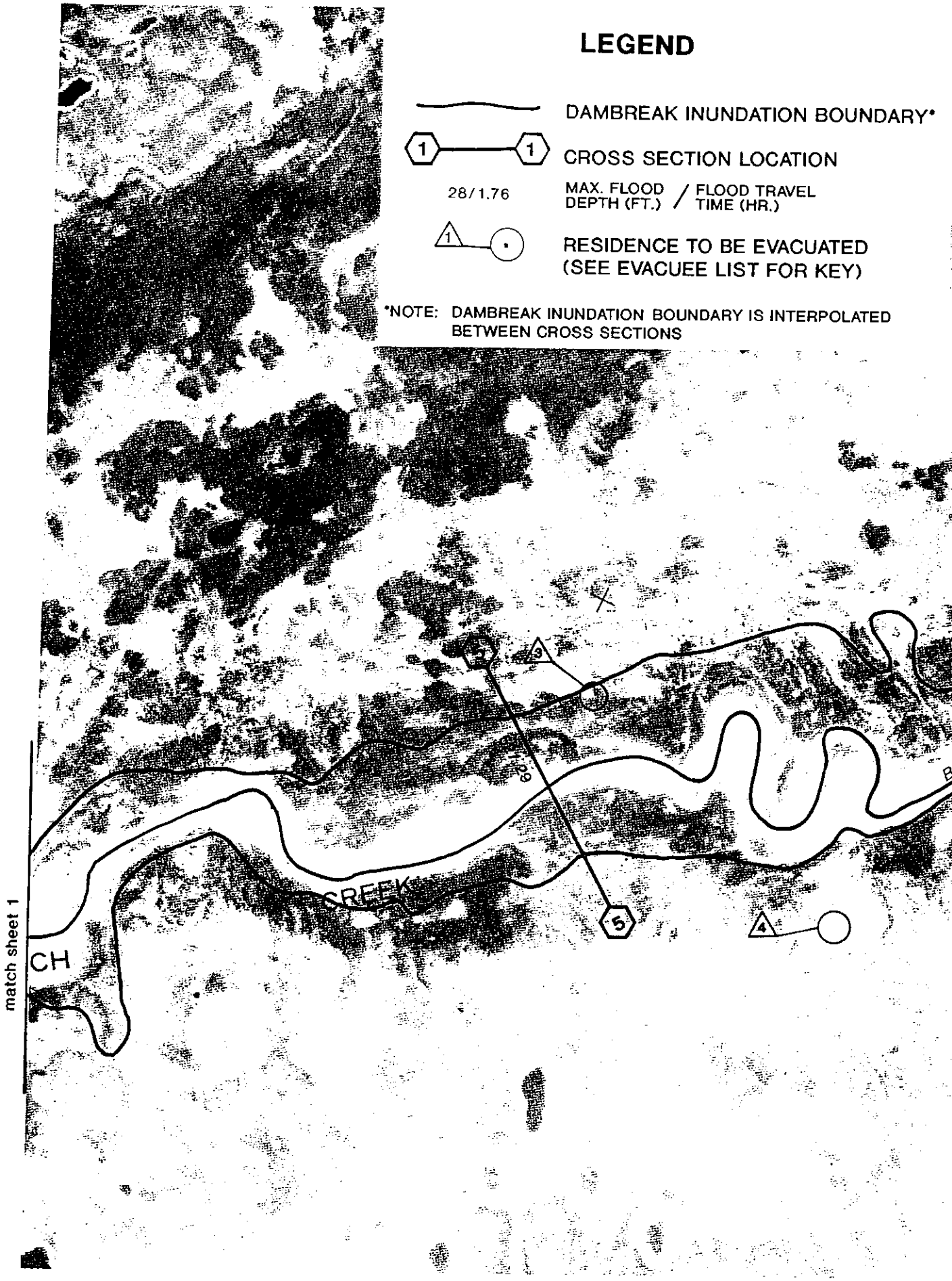
DRAWN....SUBMITTED....
TRACED....RECOMMENDED....
CHECKED....APPROVED....

DENVER, COLORADO, DECEMBER 30, 1964

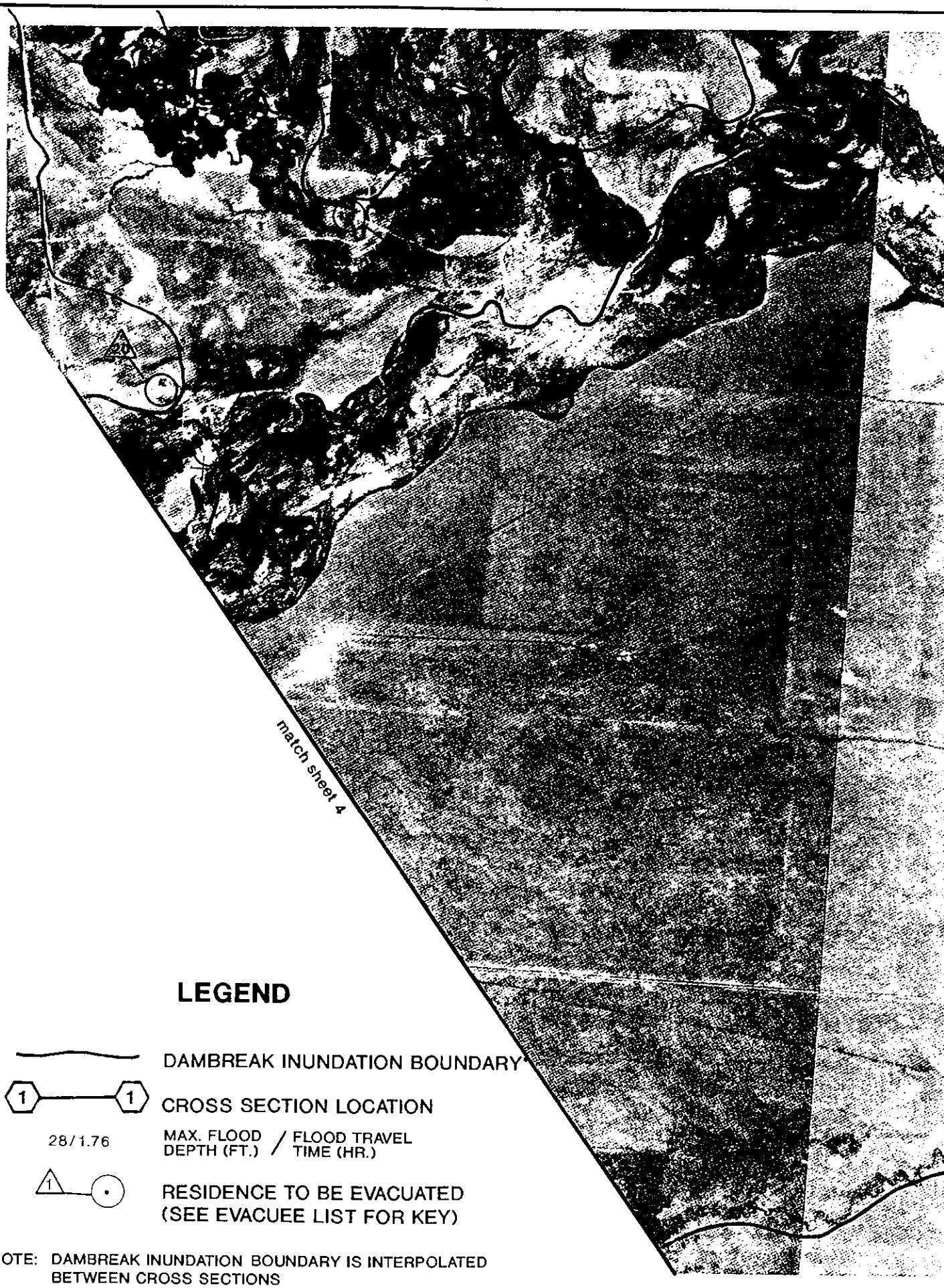
1054-D-81


SHEET 1
SHEET 2
SHEET 3
SHEET 4
FOREST


LEGEND
DAMBREAK INUNDATION BOUN
1
1
CROSS SECTION LOCATION
28/1.76
MAX. FLOOD DEPTH (FT.) / FLOOD TRAVEL TIME (HR.)
1
RESIDENCE TO BE EVACUATED
(SEE EVACUEE LIST FOR KEY)
*NOTE: DAMBREAK INUNDATION BOUNDARY IS INTERPOLAT
BETWEEN CROSS SECTIONS
SWIFT RESERVOIR


LEGEND
DAMBREAK INUNDATION BOUNDARY*
1
1
CROSS SECTION LOCATION
28/1.76
MAX. FLOOD DEPTH (FT.) / FLOOD TRAVEL TIME (HR.)
1
RESIDENCE TO BE EVACUATED (SEE EVACUEE LIST FOR KEY)
*NOTE: DAMBREAK INUNDATION BOUNDARY IS INTERPOLATED BETWEEN CROSS SECTIONS
3
3
5
4
CREEK
CH
match sheet 1

match sheet 3
41
27
9
9
1
*NOTE:



LEGEND

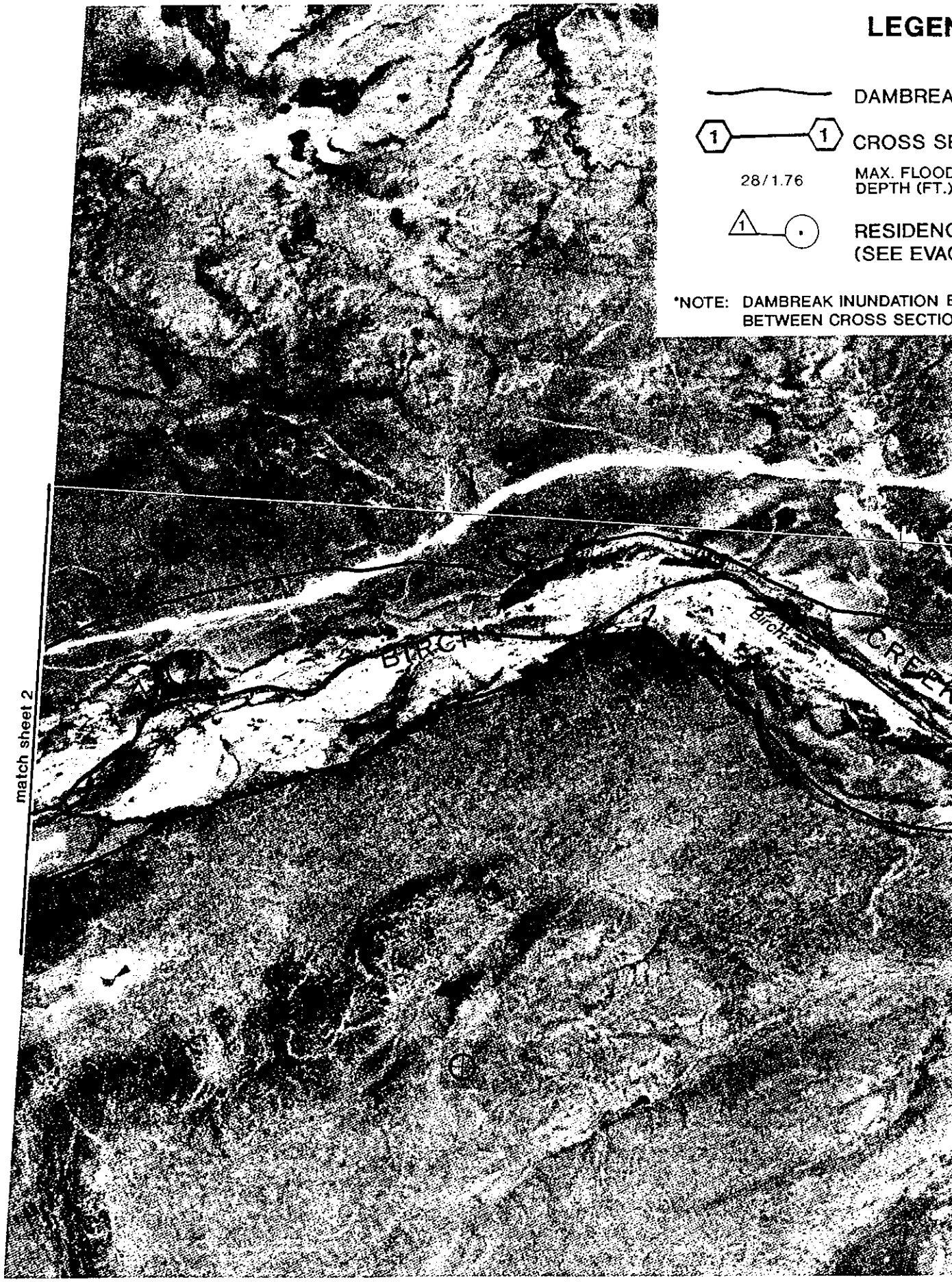
DAMBREAK INUNDATION BOUNDARY*

1 — 1 CROSS SECTION LOCATION

28/1.76 MAX. FLOOD DEPTH (FT.) / FLOOD TRAVEL TIME (HR.)

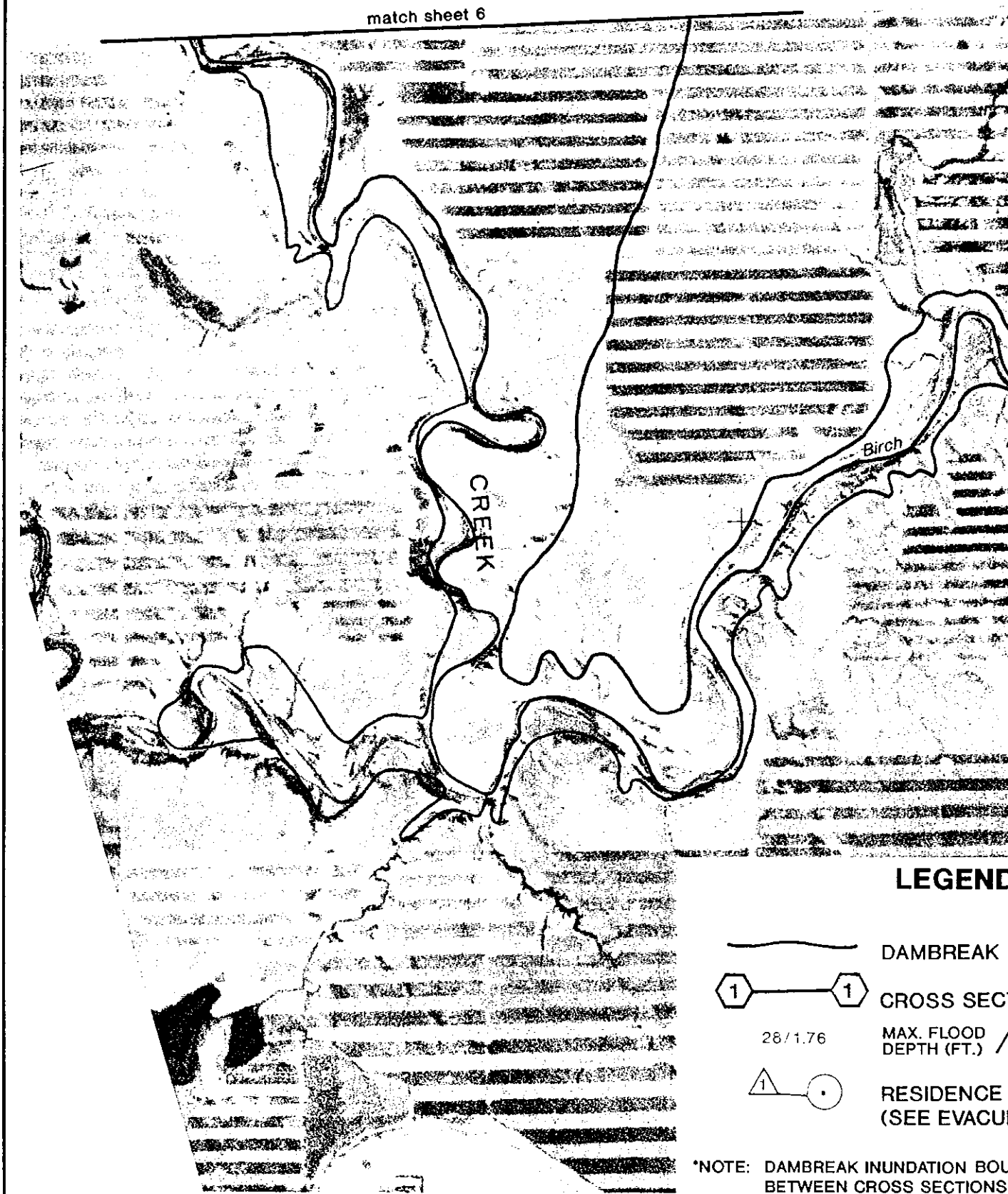
1 RESIDENCE TO BE EVACUATED (SEE EVACUEE LIST FOR KEY)

*NOTE: DAMBREAK INUNDATION BOUNDARY IS INTERPOLATED BETWEEN CROSS SECTIONS


LEGEN
DAMBREA
CROSS SE
28/1.76
MAX. FLOOD
DEPTH (FT.)
RESIDENC
(SEE EVAC
*NOTE: DAMBREAK INUNDATION B
BETWEEN CROSS SECTIO
match sheet 2
BIRCH
Birch
CREEK

match sheet 7


match sheet 6
CREEK
Birch
LEGEND
DAMBREAK IN
CROSS SECTI
28/1.76
MAX. FLOOD DEPTH (FT.) / F
RESIDENCE T
(SEE EVACUE
*NOTE: DAMBREAK INUNDATION BOUN
BETWEEN CROSS SECTIONS


match sheet 6
CREEK
Birch
LEGEND
DAMBREAK
CROSS SEC
28/1.76
MAX. FLOOD DEPTH (FT.)
RESIDENCE
(SEE EVACU
*NOTE: DAMBREAK INUNDATION BOU
BETWEEN CROSS SECTIONS

LEGEND

DAMBREAK INUNDATION BOUNDARY*

1 — 1 CROSS SECTION LOCATION

28/1.76 MAX. FLOOD DEPTH (FT.) / FLOOD TRAVEL TIME (HR.)

1 RESIDENCE TO BE EVACUATED (SEE EVACUEE LIST FOR KEY)

*NOTE: DAMBREAK INUNDATION BOUNDARY IS INTERPOLATED BETWEEN CROSS SECTIONS


CUT BANK CREEK
CREEK
TWO
MEDICINE
MEDICINE
16
16
63/4.94
match sheet 8